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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/824,838

04/15/2004

Peidong Wang

AHURA-10

6853

7590

04/10/2007

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EXAMINER

REAMES, MATTHEW L

ART UNIT

PAPER NUMBER

2891

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
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3 MONTHS

04/10/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

**Office Action Summary**

Application No.

10/824,838

Applicant(s)

WANG ET AL.

Examiner

Matthew L. Reames

Art Unit

2891

– The MAILING DATE of this communication appears on the cover sheet with the correspondence address –  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 1/16/2007.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 36-45, 55-63, 65 and 84 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 36, 37, 42, 55-65 and 84 is/are rejected.
- 7) ☒ Claim(s) 38-41 and 43-45 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 2/12/2007
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_
- ☐ Notice of Informal Patent Application
- ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Claim Objections***

1. Claims 61-63 objected to because of the following informalities: Claims 61-63 are the same as claims 55-57. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claim 36-37,42,55,61,65-67, and 84 are rejected under 35 U.S.C. 102(e) as being anticipated by Teng (WO 2003/085742 (US 20050153473)).

- a. As to claims 36 and 84 Teng teaches a method for forming a semiconductor substrate, the method comprising: providing a single semiconductor wafer having a first end and a second end in opposition to one another (see eg. fig 2), a longitudinal axis formed between the first end and the second end (see fig. 2), a top surface and a bottom surface in opposition to one another (see fig 2), a plurality of quantum wells disposed in the semiconductor wafer, and the plurality of quantum wells having a given bandgap (see item 4);

depositing a first dielectric cap on a first given portion of the top surface of the single semiconductor wafer (see item 8 or 9); and rapid thermal annealing of the single semiconductor wafer and the first dielectric cap deposited on the top surface of the single semiconductor material so as to tune the plurality of quantum wells disposed in the semiconductor wafer beneath the first dielectric cap from the given bandgap to a first tuned bandgap (see paragraph 112); wherein the first tuned bandgap is greater than the given bandgap (see paragraph 82).

b. As to claim 37 Teng teaches a method according to claim 36 wherein the top surface of the single semiconductor is entirely covered by the first given portion (see fig. 2 item 9).

c. As to claim 42, Teng teaches wherein a portion is not covered by the first cap item 8 (see fig. 2)

c. As to claim 55 and 61, Teng teaches SiO<sub>2</sub> (see claim 3).

d. As to claim 65-67, Teng teaches anneal at any temperature between 500 and 1000 degrees C (see paragraph 41)

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 56-60,62-63 is rejected under 35 U.S.C. 103(a) as being unpatentable over Teng in view of Marsh (US 20030053789).

a. As to claims 56-57, and 62-63, Teng does not sputtering either ion or electron.

Marsh teaches using a puttered SiO<sub>2</sub> film to shift the band gap of a laser.

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have used the method of Marsh (sputtered SiO<sub>2</sub> with copper) in conjunction with the method of Teng.

One would have been so motivated in order to give greater variation in the band shift.

I would have been further obvious to use either ion or electron bean sputtering to deposit the SiO<sub>2</sub>.

One would have been so motivated since ion and electron bean sputtering where standard in the art at the time.

b. As to claim 58, Marsh and Teng teaches 4 regions (see itm 45d 50d 55d 60d and 65d).

c. As to claim 59, Marsh teaches wherein the four regions output light.

d. As to claim 60 Marsh teach a laser (see paragraph 1).

***Allowable Subject Matter***

5. Claim 38-41, 43-45 and objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6. The following is a statement of reasons for the indication of allowable subject matter. Prior art fails to disclose annealing after each placement of the dielectrics in combination with other elements of claims 38 and 43.

***Conclusion***

7. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew L. Reames whose telephone number is (571)272-2408. The examiner can normally be reached on M-Th 6:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, B. William Baumeister can be reached on (571)272-1722. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MLR



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